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# HDF-EOS Development Current Status and Schedule

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# HDF-EOS 2

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- HDF4 based, storage format for EOS standard products.
- Used operationally by MODIS, MISR, ASTER, Landsat, other EOS instruments
- Will be used by EOS Aqua instruments.
- Support for Grid/Point/Swath structures
- **HDF4, HDF-EOS 2 will be supported by NCSA/NASA for the fore-seeable future.**



# Current Archive Holdings

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- GSFC DAAC: MODIS L1, L2 Atmos./Ocean
  - 416 TB 5,182,000 granules (EOS Terra)
- EDC DAAC: Landsat/ASTER/MODIS Land
  - 323 TB 3,551,000 granules
- Langely DAAC: MISR
  - 141 TB 1,266,000 granules
- NSIDC DAAC: MODIS L2, L3
  - 10 TB 887,000 granules



# HDF-EOS 5

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- Based on HDF5, a complete rewrite of HDF4 with a different interface.
  - First released in 2000.
- Designed to ‘resemble’ HDF-EOS 2 to the maximum extent possible.
  - Support same data structures
  - Added prefix ‘HE5\_’ to HDF-EOS 2 functions.
  - Doesn’t preclude HDF5 functionality.
  - Data Type changes, e.g. INT64 -> H5T\_NATIVE\_LONG



# HDF-EOS 2 → HDF-EOS 5

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- HDF-EOS 2

SWdefdatafield(swathID, fieldname, dimlist, numtype, merge)

- HDF-EOS 5

HE5\_SWdefdatafield(swathID, fieldname, dimlist, maxdimlist, numtype, merge, Maxdimlist\*)

\*New HDF5 functionality passed through. This allows the user to set an upper limit to the size of the dataset.



# HDF-EOS 5

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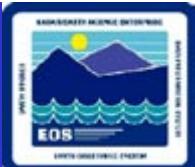
- Provide a conversion tool: heconvert
  - HDF-EOS 2 -> HDF-EOS 5
  - compliments HDF4 -> HDF5 conversion tool
- HDF-EOS 5 will be used by EOS Aura
  - Standard format for profile data developed
- **Assume that HDF-EOS 2 producers will convert when PI's determine that the time is right.**



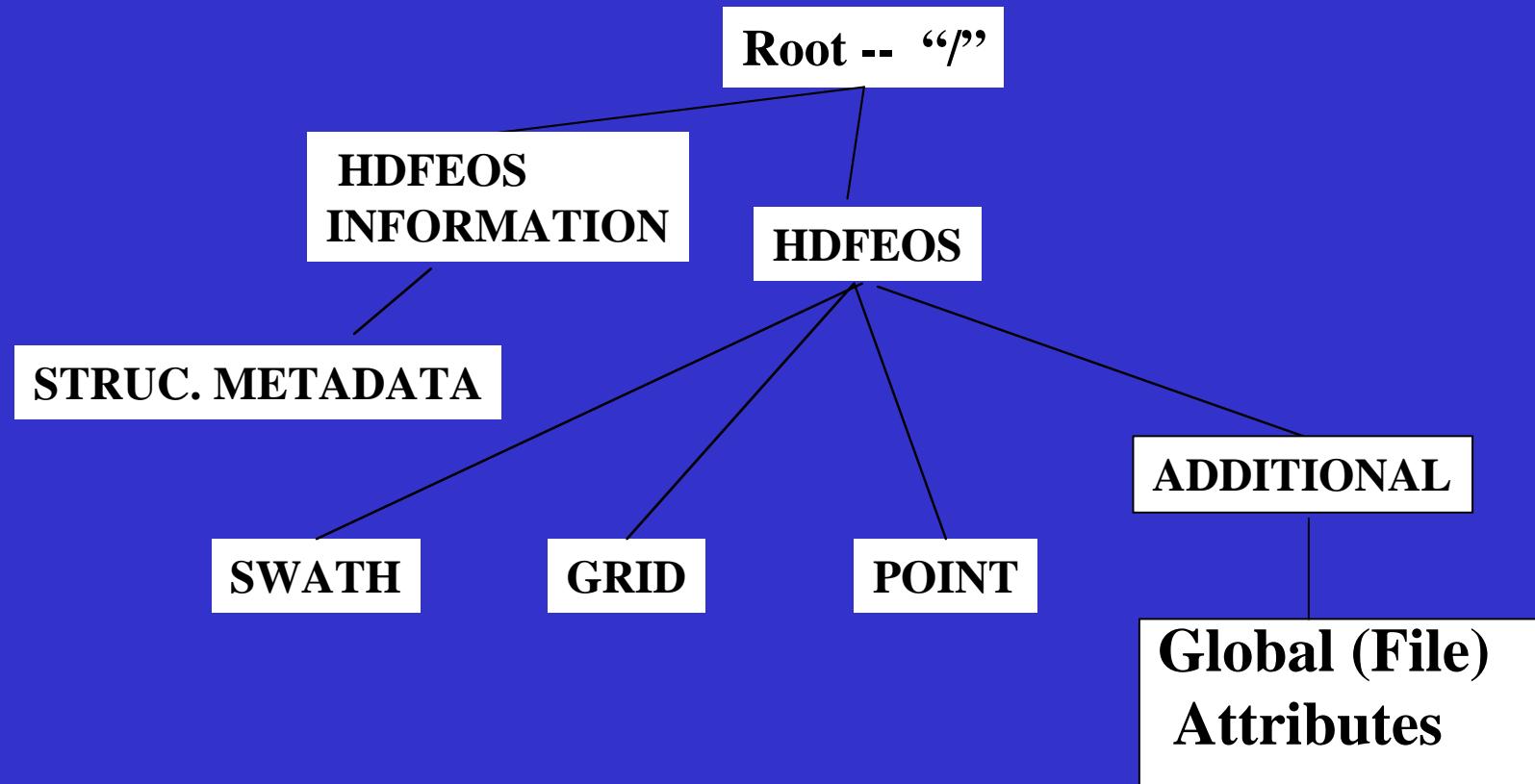
# HDF-EOS 5 Functionality

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- Basic File I/O
- Fill Values
- Compression
- Chunking/Tiling
- Swath Interface
- Grid Interface
- Point Interface
- Profile Interface
- Global (File), Group & Local Attributes
- External Data Files
- Subsetting
- Unix/Linux Support
- Threadsafe Version
- FORTRAN, C, C++
- General Table Interface (proposed)



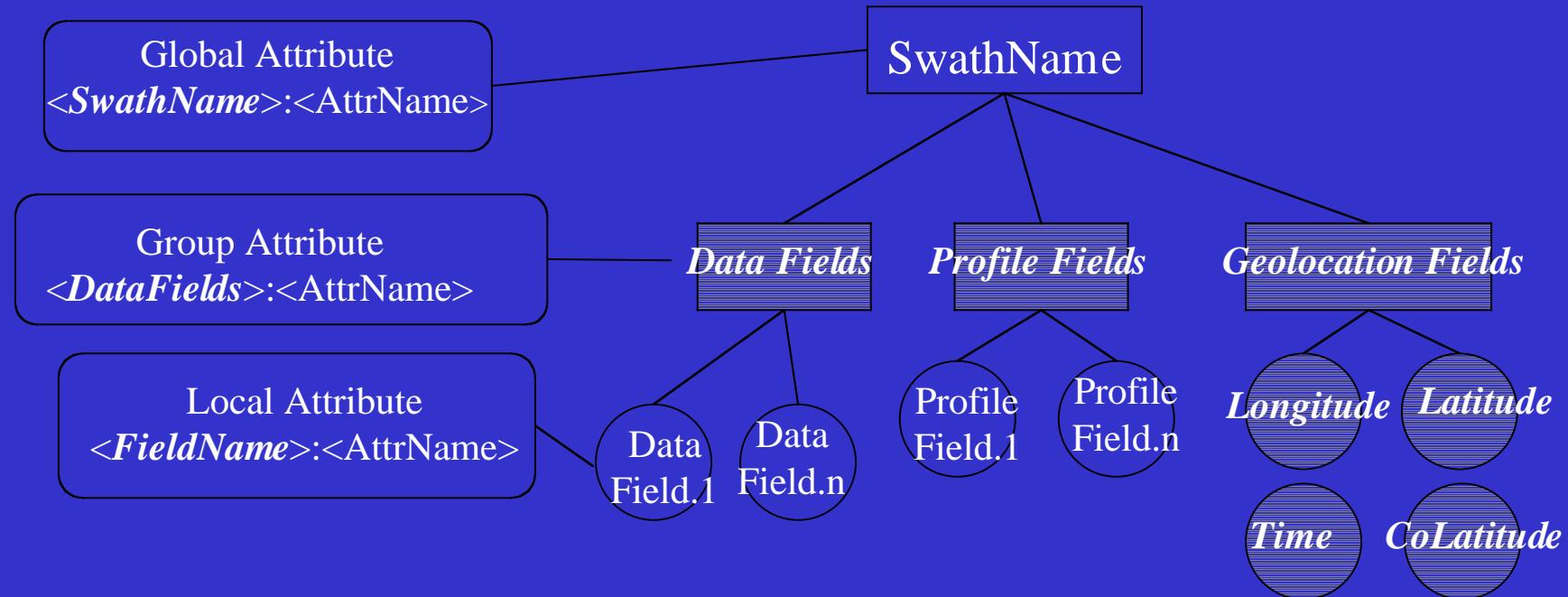
# Top Level of HDF-EOS 5 File



The new ADDITIONAL Group has global (file) attributes  
The new functionality is added to the EH(utility) interface.



# Swath Structure



Each Data Field can have  
Attributes and/or  
Dimension Scales

Shaded Objects are implemented  
in a fixed way so the user doesn't  
have direct access via the interface

Group

Attribute

Data Set



# ECS support of HDF5

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- ECS toolkit V 5.2.8 supports HDF4 and HDF5 - based applications (eg. Metadata access
  - HDF-EOS 2.7 (HDF4.1r5)
  - HDF-EOS 5.1 (hdf5-1.4.1)
- HDF5 and HDF4 must be compiled
  - HDF4 users not affected
  - HDF5 users must use PGS\_MET\_SDstart() and PGS\_MET\_SDend()



# ECS support of HDF5

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- Both flavors of HDF-EOS (HDF) part of ECS baseline.
- ECS will not crack HDF5 - based files for near future. (contents transparent to archive)
- Size limit is 2 GBytes



# Applications

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- HE5View (HDF-EOS 5 browser)
- Java Earth Browser (HDF-EOS 2 and 5 access)
- HDF-EOS to GeoTIFF converter (HDF4 based only)
- heconvert (convert HDF-EOS 2 Grid/Point/Swath to HDF-EOS 5 equivalents)
- Access libraries and applications at:  
<http://newsroom.gsfc.nasa.gov/sdptoolkit/toolkit.html>



# Issues

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- Compound data types in FORTRAN77
- Chunking with variable length and compound data types
- Only deflation compression method implemented.
- File size limit in ECS - Is two Gbytes enough?